Space Weather Forecast

Issued on Thursday, 15 September 2022 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1/Minor Storms possible through the period. M-class flares likely. Ongoing Active electron fluence.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate with one Moderate class flare from a complex region in the far northwest quadrant. This is one of three complex regions on the visible disc with two further complex regions in the south centre and southeast of the solar disc. A further benign region in the south centre disc is not felt to pose a significant risk. No new Earth-directed CMEs (coronal mass ejections) were evident in imagery.

Solar Wind / Geomagnetic Activity: The solar wind has been around background levels with only slight increases due to passing CME. Total magnetic field strength, despite starting at weak levels has reached moderate levels due to the effects of a CME which likely left the Sun on 11 September. A recent increase in magnetic field strength just reach strong levels, with the Earth likely moving into a cloud of particles trailing the CME. The north-south component was generally weak, but then reached a strong negative peak late in the period, followed quickly by a moderate positive peak. Geomagnetic activity was mainly Quiet but increased to Active between 2100-2400UTC.

Energetic Particles / Solar Radiation: The high energy proton flux was slightly elevated but well below S1 levels.

Four-Day Space Weather Forecast Summary
Solar Activity: There is a likelihood of Moderate activity through the period, with a slight chance of Strong activity.

Solar Wind / Geomagnetic Activity: A CME which was observed leaving the Sun on 11 September may have arrived at Earth early on 14 September with further increasing impacts in the following 18 hours. The effects of this CME could continue through the next few days although any exact duration is low confidence. A fast solar wind is forecast to connect with the Earth on 16 September, perhaps producing speeds of 400km/s, with these then continuing to the end of the period. Geomagnetic activity is expected to be Unsettled to Active through much of the period, due initially to the CME on 15 September. A combination of the CME and high speed stream from 16 September onward could lead to a further risk of Active or G1/Minor Storm intervals, but with a decreasing likelihood.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	60	40	30	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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